cubic spline techniques, or additional feature lines such as secondary feature lines that identify additional or secondary features in the digital image **16**. As described further in FIG. **2**B, the defective region **200** on each side of the feature line can then be filled with pixel data values representing the sky on one side and the leaf on the other side.

According to another embodiment, the reference line **206** comprises a user defined reference line. In this embodiment, the user interface (not expressly shown) allows the user to interact with the correction routine **28***a* and define one or more user defined reference lines within the defect region **200**. In some embodiments, the user can also select the pixels to be used to fill the various regions created by the user defined reference lines. In other embodiments, the user can select the region or pixels used to interpolate the color data values. For example, assuming the same digital image **16** of a leaf against a blue sky with a defective region **18** extending through the edge of the leaf and the veins of the leaf. According to one implementation, the user can define a user defined reference line representative of the edge of the leaf. In addition, the user can define reference lines representative of the veins of the leaf. As described further in FIG. **2**B, the defective regions **200** defined by the user defined reference lines can then be filled with data color values associated with the respective non-defective regions **202**.

In yet another embodiment, the reference line **206** comprises a contour line. In this embodiment, the variations in the pixel data values of the non-defective region **202** proximate the defective region **200** can be matched. This technique is somewhat similar to contour line maps. By matching the variations, the pixel data values in the defective region **200** can be approximated.

Although several examples of reference lines **206** have been described, other suitable reference line techniques may be used without departing from the scope of the present invention.

FIG. **2**B illustrates the diagram of FIG. **2**A as filled-in in accordance with one embodiment of the present invention. As illustrated, non-defective pixels **210** associated with the first boundary **204***a* are used to replace the pixels **210** in the first defective region **200***a* and non-defective pixels **210** associated with the second boundary **204***b* are used to replace the second defective region **200***b*. In a particular embodiment, the pixels **210** used to fill the defective region **200** are adjacent the respective boundaries **204***a* and **204***b*. The specific pixel data values used to fill the defective regions **200***a* and **200***b* can be calculated by direct replacement, interpolation, or any other suitable method for approximating the correct replacement pixel data value.

FIG. **3**A illustrates one embodiment of a fill correction routine **28***b*. In this embodiment, a first edge **300***a* and a second edge **300***b* are defined as portions of the boundary **204**. As illustrated in FIG. **3**B, the pixels **210** proximate the first edge **300***a* are not used to fill the defect region **200**; whereas, the pixels **210** proximate the second edge **300***b* supplied color data values used to fill the defect region **200**. Multiple methods may be used to calculate the color data values used to fill the defect region **200**, as described previously.

FIG. **4**A illustrates one embodiment of an average correction routine **28***c*. In this embodiment, the data values associated with pixels **210** forming or proximate the boundary **204** are averaged. As illustrated in FIG. **4**B, the averaged data values are then used as the data values for the pixels **210** forming the defective region **200**.

The invention described herein generally operates to correct defective regions identified using a defect map. The resulting improved digital image is more pleasing to a user. Many conventional correction programs do not utilize a defect map, and those correction programs that do utilize a defect map use data from the defective pixels to calculate the correction data for that pixel.

The invention described in the above detailed description is not intended to be limited to the specific form set forth herein, but is intended to cover such alternatives, modifications and equivalents as can reasonably be included within the spirit and scope of the appended claims. To aid the Patent Office and any readers of any patent issued on this application in interpreting the claims appended hereto, applicants wish to note that they do not intend any of the appended claims to invoke paragraph 6 of 35 U.S.C. Sec. 112 as it exists on the date of filing hereof unless the words "means for" or "step for" are used in the particular claim.

What is claimed is:

1. An image correction system comprising:

an image input device operable to produce a digital image and a defect map, wherein the defect map allows the identification of defective and non-defective regions of the digital image; and

a defect correction program having at least one correction routine operable to substantially correct the defective regions of the digital image using the non-defective regions of the digital image to produce an improved digital image, wherein the at least one correction routine comprises a reference line correction routine operable to define boundaries between defective and non-defective regions as a function of an orientation of the defective region.

2. The image correction system of claim **1**, wherein the reference line correction routine includes a feature line.

3. The image correction system of claim **1**, wherein the reference line correction routine includes a centerline.

4. The image correction system of claim **1**, wherein the reference line correction routine includes a contour line.

5. The image correction system of claim **1**, wherein the reference line correction routine includes a user defined reference line.

6. The image correction system of claim **1**, wherein the at least one defect correction program includes a fill correction routine.

7. The image correction system of claim **1**, wherein the at least one defect correction program includes an average correction routine.

8. The image correction system of claim **1**, wherein the at least one defect correction program is incorporated into a user interface of the image input device.

9. The image correction system of claim **1**, further comprising an output device operable to receive the improved digital image.

10. The image correction system of claim **1**, wherein the image input device comprises a film scanner.

11. The image correction system of claim **1**, wherein the image input device comprises a flatbed scanner.

12. A defect correction program operable to:

receive a digital image and a corresponding defect map, wherein the defect map identifies at least one defective region of the digital image and a non-defective region of the digital image; and

correct the at least one defective region using at least one correction routine, wherein the correction routine comprises a reference line correction routine operable to define boundaries between defective and non-defective regions as a function of an orientation of the defective region.